

R15

Code No: 124CQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May - 2019

DATABASE MANAGEMENT SYSTEMS

(Common to CSE, IT)

Max. Marks: 75

Time: 3 Hours

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) What is meant by data abstraction?
- b) Define the terms entity and attributes.
- c) Explain the selection and projection operations.
- d) Write brief notes on NULL values.
- e) Explain first normal form?
- f) Write short notes on inclusion dependencies.
- g) What is meant by atomicity?
- h) What is meant by recoverability?
- i) What are the clustered indexes?
- j) What is meant by linear hashing?

[2]
[3]
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PART - B

(50 Marks)

2. Discuss about querying relational data.
- OR
3. Describe the history of database systems.
4. Explain the AND, OR and NOT logical connectives with examples.
- OR
5. Discuss about complex integrity constraints in SQL.
6. Explain about dependency preserving decomposition.
- OR
7. Explain third normal form and fifth normal form.
8. Discuss about time stamp based protocols.
- OR
9. Discuss about remote backup systems.
10. Explain about Dynamic index structure.
- OR
11. Discuss about static hashing and extendable hashing.

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R16

Code No: 134AP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, April - 2018

DATABASE MANAGEMENT SYSTEMS

(Common to CSE, IT)

Time: 3 Hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(25 Marks)

- 1.a) How to represent the strong Entity set and Weak entity set in ER-Model? [2]
- b) Explain about various integrity constraints in relational model. [3]
- c) What are the SQL statements are used to retrieve and modify the database? [2]
- d) Let $R=(ABC)$ and $S=(DEF)$ let $r(R)$ and $s(S)$ be relations on schema R and S. Give an expression in the Domain relational calculus that is equivalent to each of the following. [3]
- i) $\sigma_{B=25}(r)$ ii) $\prod_{A,F}(\sigma_{C=D}(rXs))$
- e) What is schema refinement? [2]
- f) Define Multi valued dependencies and join dependency. [3]
- g) What is serilizabuiltly? [2]
- h) Explain Failure with loss of nonvolatile storage. [3]
- i) What is primary and secondary indexing? [2]
- j) What is the difference between indexing and hashing? [3]

PART-B

(50 Marks)

2. Give an overview of database architecture. [10]
- OR
- 3.a) Give an overview of database languages – DDL and DML. [5+5]
- b) What are speciality databases? Explain.
- 4.a) Explain the fundamental operations in relational algebra with examples. [5+5]
- b) What aggregate operators does SQL support? Explain with examples.
- OR
- 5.a) What is trigger? Explain how to implement triggers in SQL? [5+5]
- b) Explain the following Operators in SQL with examples:
i) SOME ii) IN iii) EXCEPT v) UNION.

- 6.a) What do you mean by scheme refinement? Explain how it can be accomplished? [5+5]
 b) What are the problems caused by redundancy and decomposition of relation? [5+5]

OR

- 7.a) Compute the closure of the following set of functional dependencies for a relation scheme $R(A,B,C,D,E,F,G,H)$, $F = \{AB \rightarrow C, BD \rightarrow EF, AD \rightarrow G, A \rightarrow H\}$. [28]
 List the candidate keys of R.

- b) Explain 4NF, 5NF normal forms with examples. [5+5]

- 8.a) What is transaction? Explain the properties of transaction.
 b) Give an overview of validation based protocol. [5+5]

OR

- 9.a) Explain about the Multiple granularity Concurrency Control protocol. [28]
 b) Explain about remote backup system. [5+5]

- 10.a) Give a comparison of various file organizations.
 b) Describe the Insertion and Deletion Operations in B+ trees. [5+5]

OR

11. How does *Extendable hashing* use a directory of buckets? How does it handles the insert and delete operations? [10]

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R16

Code No: 134AP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, December - 2018

DATABASE MANAGEMENT SYSTEMS

(Common to CSE, IT)

Time: 3 Hours

Max. Marks: 75

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Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(25 Marks)

- 1.a) Define select and create statements. [2]
- b) How would you map N-ary relationship into relations? [3]
- c) What are Nested Queries? [2]
- d) Explain with an example about aggregate operators. [3]
- e) What are the properties of Decomposition? [2]
- f) Give an example of a relation scheme R and a set of dependencies such that R is in BCNF but not in 4NF? [3]
- g) What happens if system crashes during analysis? How do you limit the amount of work in UNDO? [2]
- h) What are the ACID Properties of a transaction? [3]
- i) What is an index on a file of records? Why is it needed? [2]
- j) What are the features of B⁺ trees? [3]

PART-B

(50 Marks)

- 2.a) How are different schema layers related to the concepts of logical and physical data independence?
- b) What are the functions of database manager?
- c) What are statements used to update and alter the table contents? [3+4+3]

OR

- 3.a) Draw ER diagram for the following:
A teacher can teach many courses. A student can enroll in many courses. A course may be a part of one or many programmes. A teacher can be mentor for many students, however a student can have only one mentor.

- b) Refer to the relation schemas given below and answer the questions asked after schema description.

Suppliers (S.No., Sname, City)

Parts (P.No., Pname, Colour, City)

Projects (ProjectNo., ProjectName, City)

Sup-Par-Proj (S.No., P.No., ProjectNo., Quantity)

What are the entity integrity constraints in the relations?

What are the referential integrity constraints in the relations?

[5+5]

4.a) Consider the following schema:
 Suppliers(sid: integer, sname: string, address: string)
 Parts(pid: integer, pname: string, color: string)
 Catalog(sid: integer, pid: integer, cost: real)

The Catalog relation lists the prices charged for parts by Suppliers. Write the following queries in Tuple relational calculus:

1. Find the pnames of parts for which there is some supplier.
2. Find the snames of suppliers who supply every part.
3. Find the pnames of parts supplied by Acme Widget Suppliers and by no one else.
4. Find the sids of suppliers who charge more for some part than the average cost of that part (averaged over all the suppliers who supply that part).
5. For each part, find the sname of the supplier who charges the most for that part.

b) With relevant examples discuss any 6 operations in Relational Algebra. [7+3]

OR

5.a) Consider the following relations:

Hotel (Hotel_no, Hotel_name, City)
 Room (Room_no, Hotel_no, Type, Price)
 Booking (Hotel_no, Guest_no, DateFrom, DateTo, Room_no)
 Guest (Guest_no, GuestName, GuestAddress)

Write the appropriate queries in SQL for the following:

- i) Find the average price of a room
- ii) List the names and address of all guests with bookings for a hotel in London, alphabetically ordered by name
- iii) Find the total income from all the rooms of the hotels in New York
- iv) List the Name(s) of Guest(s) at the winner hotel, who are paying highest price for a room.

b) For the relations given below:

R1:	<table border="1"><tr><td>A</td><td>B</td></tr><tr><td>A1</td><td>B1</td></tr><tr><td>A7</td><td>B7</td></tr><tr><td>A2</td><td>B2</td></tr><tr><td>A4</td><td>B4</td></tr></table>	A	B	A1	B1	A7	B7	A2	B2	A4	B4
A	B										
A1	B1										
A7	B7										
A2	B2										
A4	B4										

R2:	<table border="1"><tr><td>A</td><td>B</td></tr><tr><td>A1</td><td>B1</td></tr><tr><td>A2</td><td>B2</td></tr><tr><td>A3</td><td>B3</td></tr><tr><td>A4</td><td>B4</td></tr></table>	A	B	A1	B1	A2	B2	A3	B3	A4	B4
A	B										
A1	B1										
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A3	B3										
A4	B4										

R3:	<table border="1"><tr><td>B</td></tr><tr><td>B1</td></tr><tr><td>B2</td></tr></table>	B	B1	B2
B				
B1				
B2				

Find R_1 / R_3 , $R_1 \cap R_2$, $R_1 \times R_2$ [4+6]

6. Explain in detail about 1NF, 2NF and 3NF with suitable examples. Find the highest normal form in R(A, B, C, D, E) under following functional dependencies.

ABC → D

CD → AE

OR

7.a) Write the need for schema refinement in relational database design.

b) Define Join dependency. Explain 5NF with suitable example.

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- 8.a) Explain the Remote Backup system. [5+5]
- b) How transaction management supported in SQL?

OR

- 9.a) How will you determine whether a schedule is serializable or not. Discuss any locking protocol how it resolves conflicts during concurrent execution of transactions? [7+3] 28 2
- b) Differentiate Transaction Recovery and Media Recovery? 28

- 10.a) Discuss in detail about all file organization methods.
- b) Construct a B⁺ tree to insert the following key elements (order of the tree is 3) [6+4]
5, 9, 12, 16, 21, 25, 32, 34, 38, 42, 51, 55, 61, 65

OR

- 11.a) Compare and contrast Hash based indexing and tree based indexing. 28 2
- b) Suppose that we are using extendible hashing on a file containing records with the following search-key values: 5, 9, 12, 16, 21, 25, 32, 34, 38, 42, 51, 55, 61, 65. Show that the extendible hash structure for this file if the hash function is $h(x) = x \text{ mod } 3$ and bucket can hold five records. [5+5]

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B.Tech II Year II Semester Examinations, December - 2018

DATABASE MANAGEMENT SYSTEMS

(Common to CSE, IT)

Time: 3 Hours

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Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

- 1.a) Write short notes on DDL and DML [2]
- b) List various symbols used in ER diagrams. [3]
- c) "Relational algebra is procedural and tuple relational calculus is non-procedural language". Justify. [2]
- d) Write a note on correlated sub queries. [3]
- e) Explain about multivalued dependency. [2]
- f) What are the problems caused by redundancy? [3]
- g) What do you mean by serializability of a schedule? [2]
- h) Explain different states of transaction. [3]
- i) What is local depth? [2]
- j) What is primary index? [3]

PART-B

(50 Marks)

- 2.a) With a neat diagram, explain the components of database system structure.
 - b) Draw an ER diagram for hospital management database. [5+5]
- OR
- 3.a) Explain the process of translating ER diagrams to relations.
 - b) Describe three level architecture of database schema. [5+5]
- 4.a) Consider the following relations.
Emp(ENAME, STREET, CITY)
Works(ENAME, CNAME, SALARY)
Company(CNAME, CITY)
Manages(ENAME, MNAME)
Express the following queries in relational algebra.
i) Find names of all employees who earn more than every employee of "Bank Corporation".
ii) List the city of leaving of all the managers.
 - b) Define Trigger. Differentiate row level and statement triggers. [5+5]

OR

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5.a) Differentiate tuple and domain relational calculus.

b) Consider the following relations

Supplier(Sid, Sname, Address)

Parts(Pid, Pname, Color)

Catalog(Sid, Pid, Cost)

Write the following queries in SQL

i) Find the Snames of the suppliers who supply every part.

ii) For each part, find the Sname of the supplier who charges the most for that part.

[5+5]

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6.a) Write the procedure to find minimal cover of functional dependency set.

b) Define Normal form. Explain 2NF, 3NF and BCNF with examples.

[5+5]

OR

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7.a) What are the properties of decomposition? Explain in detail.

b) Explain the following terms:

i) Functional dependency.

ii) Partial Functional Dependency

iii) Transitive Dependency.

[4+6]

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8.a) Explain the need for locking and discuss two phase locking protocol in detail.

b) What is shadow paging? Explain.

[5+5]

OR

9.a) Explain about multiple granularity.

b) Discuss about recoverable schedules and cascadeless schedules.

[5+5]

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10.a) Explain the process of inserting a record in to a B⁺ tree.

b) Explain about linear hashing.

[5+5]

OR

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11.a) What is the role of global depth in extendible hashing?

b) Differentiate clustered and un-clustered index.

[5+5]

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R15

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May - 2017

DATABASE MANAGEMENT SYSTEMS

(Common to CSE, IT)

Time: 3 Hours

Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) What is DBMS? What are the goals of DBMS? [2]
- b) Explain about DDL and DML languages. [3]
- c) Explain views in SQL language. [2]
- d) Explain domain relational calculus. [3]
- e) Define loss less join decomposition with example. [2]
- f) What is the difference between 3NF and BCNF? [3]
- g) What is locking Protocol? [2]
- h) When are two schedules conflict equivalent? What is conflict serializable schedule? [3]
- i) Why are tree-structure indexes are good for searches, especially range selections. [2]
- j) What is the main difference between ISAM and B+ tree indexes? [3]

PART-B

(50 Marks)

- 2.a) What are the main components in a DBMS and briefly explain what they do.
 - b) Explain the following:
 - i) View of Data
 - ii) Data Abstraction
 - iii) Instances and Schemas. [5+5]
- OR**
- 3.a) Develop ER-Diagram for a hospital with a set of patients and a set of medical doctors. Associated with each patient a log of the various tests and examinations conducted.
 - b) What is relation? Differentiate between a relation schema and relation instance define the term arity and degree of a relation? What are domain constraints? [5+5]
- 4.a) Explain the fundamental operations in relational algebra with examples.
 - b) Explain the following Operators in SQL with examples:
 - i) SOME
 - ii) IN
 - iii) EXCEPT
 - iv) EXISTS [5+5]
- OR**
- 5.a) Let $R=(ABC)$ and $S=(DEF)$ let $r(R)$ and $s(S)$ both relations on schema R and S. Give an expression in the Tuple relational calculus that is equivalent to each of the following.
 - i) $\sigma_{B=C}(r)$
 - ii) $\prod_{A,E}(\sigma_{C=D}(r \times s))$
 - iii) $r \cap s$
 - b) What are integrity constraints? Define the terms primary key constraints and foreign key constraints. How are these expressed in SQL? [5+5]

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6.a) What is normalization? What are the conditions are required for a relation to be in 2NF, 3NF and BCNF explain with examples.

b) Compute the closer of the following set of functional dependencies for a relation scheme. $R(A,B,C,D,E)$ $F=\{A \rightarrow BC, CD \rightarrow E, B \rightarrow D, E \rightarrow A\}$
List out the candidate keys of R. [5+5]

OR

7.a) What are the conditions are required for a relation to be in 4NF and 3NF explain with examples.

b) Compute the closer of the following set of functional dependencies for a relation scheme. $R(A,B,C,D,E,F,G,H)$. $F=\{AB \rightarrow C, BD \rightarrow EF, AD \rightarrow G, A \rightarrow H\}$
List the candidate keys of R. [5+5]

8.a) What is transaction? Explain the ACID Properties of transactions.

b) Explain the Check point log based recovery scheme for recovering the database. [5+5]

OR

9.a) Describe the steps in crash recovery in ARIES.

b) Explain the *Time Stamp - Based Concurrency Control* protocol. [5+5]

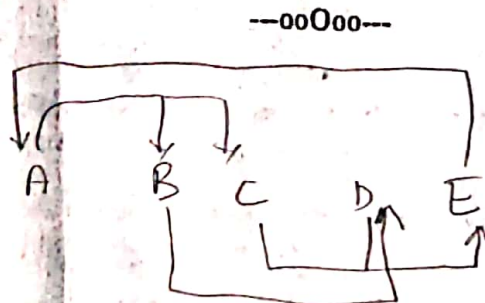
10.a) Explain Deletion and insertion operations in ISAM with examples.

b) How does *Extendable hashing* use a directory of buckets? How does it handles insert and delete operations. [5+5]

OR

11.a) Explain how insert and delete operations are handled in a static hash index.

b) Explain deletion and insertion operation in *B+ trees*. [5+5]



Code No: 114CQ

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May-2015

DATABASE MANAGEMENT SYSTEMS

(Common to CSE, IT)

Time: 3 Hours

Max. Marks: 75

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Part A is compulsory which carries 25 marks. Answer all questions in Part A.
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PART- A

(25 Marks)

- 1.a) Differentiate between schema and data model. [2M]
- b) Give an example for total participation and partial participation. [3M]
- c) List the primitive operators in Relational Algebra. [2M]
- d) What is an active database? [3M]
- e) Define SECOND Normal form. [2M]
- f) Write about join dependencies. [3M]
- g) What methods are used to assign timestamps to transactions? [2M]
- h) What is the significance remote backup system? [3M]
- i) What is meant by secondary index? [2M]
- j) How to compute the disk access time? [3M]

PART- B

(50 Marks)

- 2.a) List various categories of database users and discuss their interfaces to DBMS. [5+5]
 - b) Discuss the functionality of query evaluation engine. [5+5]
- OR
3. Construct an Entity-Relationship diagram for a online shopping systems such as Jabong/Flipcart. Quote your assumptions and list the requirements considered by you for conceptual database design for the above system. [10]
- 4.a) With a suitable example explain division operation in relational algebra. [5+5]
 - b) What is the usage of 'group by' and 'having' clauses in SQL? [5+5]
- OR
5. Consider the following schema to write queries in Domain relational calculus:
Sailor(sid, sname, age, rating)
Boats(bid, bname, bcolor)
Reserves(sid, bid, day)
a) Find the boats reserved by sailor with id 567.
b) Find the names of the sailors who reserved 'red' boats.
c) Find the boats which have at least two reservations by different sailors. [10]
6. What is meant by closure of F? Where F is the set of functional dependencies. Explain computing F+ with suitable examples. [10]
- OR
- 7.a) Differentiate between 3NF and 4NF. [5+5]
 - b) Explain the problems related to decomposition. [5+5]

- 6.a) Explain different normal forms based on functional dependencies. [5+5]
b) Explain about dependency preserving decomposition.

OR

- 7.a) Explain BCNF. Give an example. [5+5]
b) What are the steps to be followed to convert a relation in 3NF to BCNF?

- 8.a) Explain ARIES in detail. [5+5]
b) How the lock manager implements lock and unlock requests? Explain.

OR

- 9.a) How the concurrency control is done in B+ trees? Explain. [5+5]
b) What is schedule? Explain about serial and non serial schedule.

- 10.a) What is a composite search key? What are the pros and cons of composite search keys? [5+5]
b) What are the performance implications of disk structure? Explain.

OR

- 11.a) What are the different RAID levels? Explain. [5+5]
b) Compare linear hashing and extendable hashing.

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